

60 EAST



10TH ST.

THE LATEST TYPE OF RESEARCH MICROSCOPE for Binocular and Monocular Vision

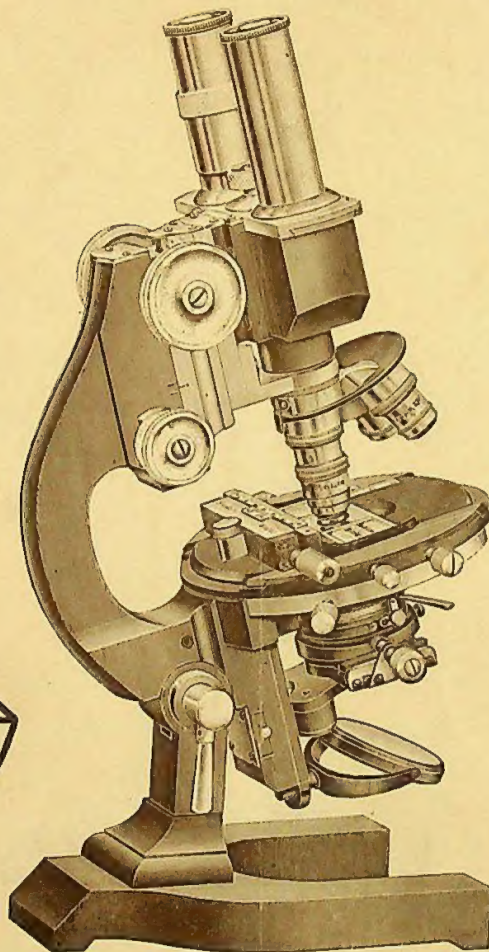


Fig. 1

COMBINATION MICROSCOPE STAND "ABM" Binocular Body Tube Attached

This Microscope can be used with any objective from the lowest power to the highest oil immersion.

(1)

359/368

The Latest Type
OF
RESEARCH MICROSCOPE
Leitz Combination Microscope "ABM" for Binocular
and Monocular Vision

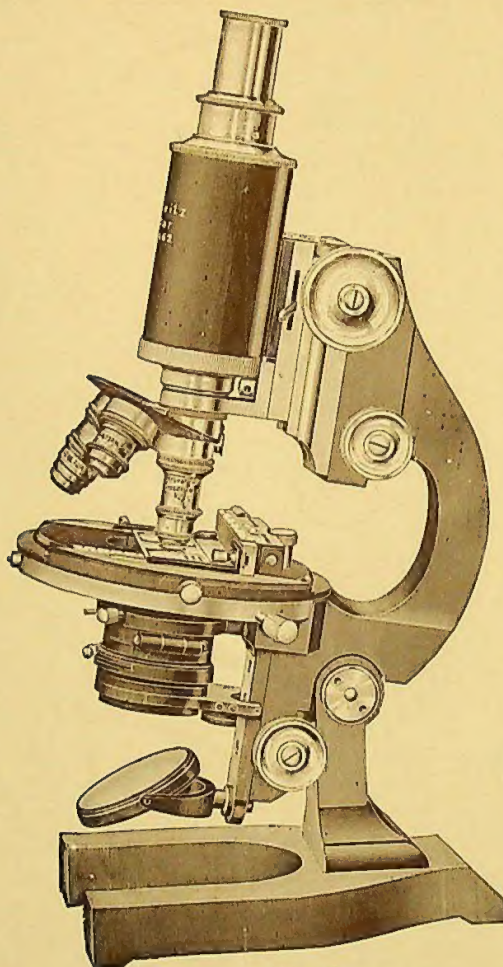


Fig. 2

COMBINATION MICROSCOPE STAND "ABM"
Monocular Body Tube Attached

This Microscope, as to its Binocular Feature, is identical in construction to the Leitz "Mon-Objective Binocular" Microscope. The latter has originally been designed by Leitz and since its successful introduction in 1913, has lately been copied by other manufacturers. The optical and mechanical qualities, characteristic of the Leitz instruments have been adopted in an equally rigid manner for this microscope and in consequence we fully expect to retain the prestige for the original pattern, due to its points of superiority.

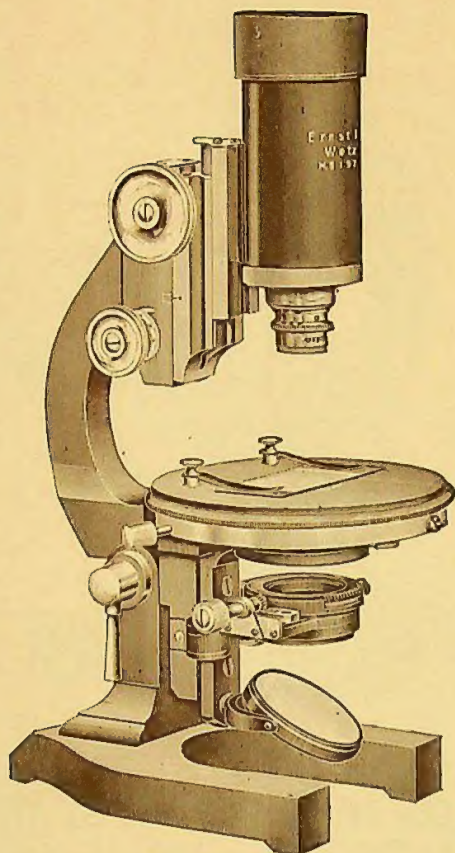


Fig. 3

COMBINATION MICROSCOPE STAND "ABM" Monocular Body Tube Attached

(Condenser and draw-tube removed for photography with wide angle objectives)

PREFACE

Ever since the introduction of optical appliances, the aim has been to make them useful for both eyes. Formerly no special reason was known for doing so, but the fact that two eyes give better vision than one.

While a few microscopes for binocular vision have been developed, the early instruments were made for low power only. The images, being of unequal illumination, caused considerable eyestrain. "Greenough's" Binocular Microscope with paired objectives (thus giving stereoscopic image) came into use in 1897 and met with success. The latest models of this binocular microscope, the "**Greenough-Leitz**," are perfect. However, this type of microscope is useful for low power only.

Taking all factors into consideration, none of the older constructions solved the problem of a binocular microscope for high power work. In order to approach the ideal, it was necessary to construct an instrument that is capable of utilizing the splendid objectives already in existence without reducing their numerical aperture, applying to both images equal illumination.

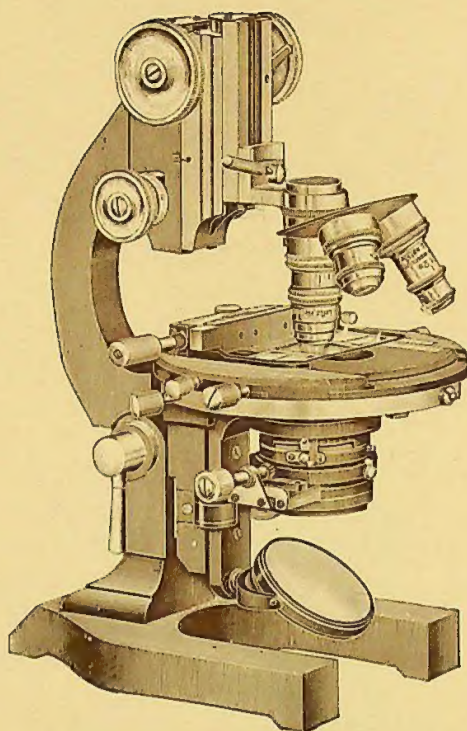


Fig. 4

COMBINATION MICROSCOPE STAND "ABM" without Body-Tubes, showing nosepiece adapter and nosepiece attached

With this in mind, Dr. F. Jentzsch, member of the Leitz research staff, has designed the "Mon-Objective Binocular" Microscope. The usual microscope-tube has been replaced by a prism body-tube, containing various prism units. The prisms are of high quality; and so perfectly calculated that no noticeable loss of light is experienced; in fact, when both eyes are used, the image obtained is considerably brighter than when an ordinary microscope is employed.

The eyepieces are mounted parallel to each other. This is a very important innovation. It affords a complete relaxation of the eyes when using the instrument. Notwithstanding the repeated directions given, to leave the eye at rest, not to accommodate when using a microscope, it is an impossible task to perform. To look convergently and not to accommodate is against nature, as these two functions are automatically interdependent.

When using a monocular microscope, the eye not employed is the one more fatigued. While the busy eye is focussed upon the specimen which remains at a given distance, the unused eye receives constantly changing images. It requires considerable energy to disregard them. The microscope image in the employed eye is a constant invitation for the unemployed one to converge toward it and accommodate accordingly. Early fatigue intervals is the unavoidable result. After a brief period the keenness of perception diminishes. Intervals of rest constantly increasing in length, have to be taken frequently. Microscopic observation becomes hard work. This is also the case when using binocular microscopes having the eyepieces arranged in an angle to each other.

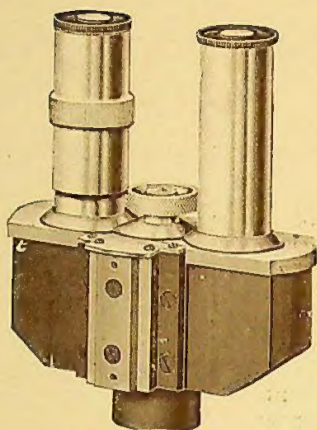


Fig. 5
Binocular Body
Tube.

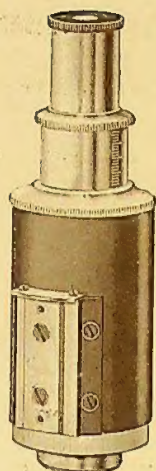


Fig. 6
Monocular Body
Tube.

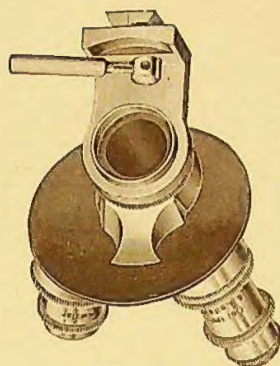


Fig. 7
Nosepiece Adapter
with triple nosepiece.

The main advantage of the **Combination Microscope "ABM"** is the **complete elimination of eye-strain** and the resulting fatigue. It enables one to attend to microscopic investigations for much longer periods in a most convenient and agreeable manner. Especially is this true when observations with darkfield condensers or other high power work are undertaken. Viewed through the **Leitz Combination Microscope "ABM" with Binocular Body Tube**, the **quality of image is indeed remarkable**. The object appears much clearer, more details being noticeable than with the ordinary monocular microscope.

It is very rare that both eyes have the same keenness of perception. One eye may be more sensitive to color, the other to minute details. In binocular vision it is possible for them to compensate one another, utilizing their optical qualities to the fullest extent. In making use of both eyes at the same time these faculties combine, increasing the distinctness and brilliancy of the image considerably. Comparing a monocular image with one obtained through the **Leitz Combination Microscope "ABM" with Binocular Body Tube**, the impression of seeing more clearly is unmistakable. The object seems to have more vigor, more life. Binocular vision adds a sensation of depth, plasticity and richness unattainable with the monocular microscope.

Distinctive Features Summarized:

1. Convertible from Binocular to Monocular Vision or visa versa.
2. Binocular Body Tube for complete Binocular Vision.
3. Monocular Body Tube of large diameter for Monocular Vision and Micro-Photography.
4. Perfect adjustment of the eyepieces by rack and pinion to any interpupillary distance.
5. Adjustment of any difference in refraction between the eyes.
6. Complete elimination of eye-strain; restful to the eyes.
7. Improved quality of image.
8. Eyepieces mounted parallel, not convergent, as in other constructions.
9. Any favored objective, from the lowest power dry to the highest oil immersion, can be utilized.
10. Periplan—Compensating—Huyghenian—and Orthoscopic—Eyepieces of the various focal lengths are adaptable.
11. The full numerical aperture of objectives is maintained.
12. Special Nosepiece Adapter, mounted to microscope stand, independent of the body tubes, maintains the objectives permanently centered, regardless if the Binocular—or Monocular Body Tube is used.

Details of Construction

GENERAL: In general design and size the stand is similar to the research microscopes "AA" and "A."

BASE: Horseshoe form of large and heavy type.

ARM: Heavy curved form, which provides ample space for the accommodation of specimens of large size.

PILLAR: With double joint and clamping lever to hold the stand in any desired position; stops are provided for horizontal and vertical position.

BINOCULAR BODY-TUBE (Fig. 5): It consists of casing, containing a prism unit comprising various prisms; the casing being provided with two tubes for the accommodation of paired eyepieces. The eyepiece-tubes are arranged parallel to each other and fitted to a slider which permits their interpupillary adjustment, a scale indicates the pupillary distance. One eyepiece tube is supplied with a spiral screw arrangement to correct differences of vision between the eyes of the observer. The prism housing carries a society thread for the accommodation of any microscope objective. This tube is fastened to the stand in sliding same into the rack and pinion track and locking it securely in place by means of a lever with eccentric bearing; a slight touch suffices to exert a locking grip (Fig. 4).

MONOCULAR BODY-TUBE (Fig. 6): It is equal to the tube of Stands "AA" and "A." Its outside diameter is 50 mm. It is provided with draw-tube and tubulation for standard size eyepieces; the draw-tube is graduated in single millimeters, every tenth line being numbered. It is adjustable in metal sleeve and furnished with society thread for objectives. The lower collar as well as the draw-tube can be detached for use with wide angle objectives, i.e., Micro summars. **The Monocular Body Tube converts Stand "ABM" into a microscope for Micro-Photography.** This Tube is attached in an identical manner as explained with the Binocular Body Tube.

NOSEPIECE ADAPTER (Fig. 7): This adapter is attached to rack and pinion track of the stand and in carrying the nosepiece independent from the body-tubes **maintains the objectives permanently centered**, regardless if the Binocular—or Monocular Body-Tube is made use of.

FOCUSsing ADJUSTMENT: Coarse- and fine-adjustment are provided with a safety device to prevent crushing specimens and damage to objectives. The fine-adjustment is of the continuous motion type which represents the most sensitive focusing arrangement with which all the Leitz research microscopes are equipped. A divided drum with vernier records the lateral displacement of the microscope tube and therefore permits measurements of the thickness of the specimen.

STAGE: Revolving plain circular type of metal with vulcanite cover provided with centering screws. It is removable and permits substitution of the rotary mechanical stage. The standard type of detachable mechanical stage can likewise be used.

SUBSTAGE: Complete model "a" with swing-out three-lens condenser N. A. 1.40; rack and pinion for focussing the entire substage along the optical axis; iris diaphragm above condenser; iris diaphragm below condenser, supplied with rack and pinion for oblique illumination, this diaphragm is attached to a joint to permit same to be swung aside; plano and concave mirror has universal joint and is furthermore attached to a dove-tail slider, to permit accurate adjustment.

FINISH: Arm, body-tubes, upright and foot in alcohol-proof black lacquer; the other parts in yellow lacquer.

CASE: Mahogany, highly polished, with lock and key. Morocco leather case is provided to accommodate both body-tubes, this case fits inside the mahogany cabinet.